

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims presently in the application as follows:

1. (Thrice Amended) A method of using a conveyor system for processing substrates in plural vacuum processing chamber installation portions, the conveyor system including:  
an atmospheric loader, having a location for positioning at least one cassette containing the substrates, the location having an upper region which is open to a cassette transferring path;

a vacuum loader; and

a lock chamber, having an atmospheric loader side and a vacuum loader side, and having a gate valve for said atmospheric loader side and another gate valve for said vacuum loader side,

wherein said vacuum loader has

(1) a transfer chamber connected to the lock chamber via the another gate valve, the method comprising the steps of:

transferring substrates, to be processed, [from said atmospheric loader,] from a cassette at said location of said atmospheric loader, to said lock chamber;

after transferring substrates to the lock chamber, providing a vacuum in said lock chamber;

after providing a vacuum in said lock chamber, transferring substrates to be processed, from said lock chamber to said transfer chamber;

thereafter, transferring processed substrates from said transfer chamber to said lock chamber; and

transferring processed substrates from said lock chamber to said atmospheric loader from which the substrates had been transferred to the lock chamber,

wherein said gate valve and said another gate valve are opened and closed every carrying-in of a substrate, to be processed, to the lock chamber, and every carrying-out a processed substrate from the lock chamber.

3. (Four Times Amended) A method of transferring cassettes in operating a vacuum processing apparatus having plural vacuum processing chambers, the vacuum processing apparatus including:

an atmospheric loader, having a location for positioning at least one cassette containing samples, the location having an upper region which is open to a cassette transferring path;

a vacuum loader; and

a lock chamber for connecting said atmospheric loader and said vacuum loader, said lock chamber having opening and closing devices for carrying-in samples to be processed in the vacuum processing chambers into the lock chamber and for carrying-out processed samples from the lock chamber, wherein

said atmospheric loader includes a cassette mount unit located in front of said lock chamber, and

said cassette mount unit has a cassette positioning

plane in which all cassettes, containing the samples to be processed, are positioned in front of a front wall of said lock chamber, said cassette positioning plane being at said location,

the method comprising a step of:

placing said cassette on and removing said cassette from said cassette mount unit which is in front of said lock chamber while maintaining a surface of the samples substantially horizontal,

wherein the opening and closing devices of the lock chamber are opened and closed every carrying-in of a [wafer] sample, to be processed, to the lock chamber, and every carrying-out of a processed [wafer] sample from the lock chamber.

17. (Four Times Amended) A method of treating a semiconductor wafer in plural vacuum processing chambers, comprising the steps of:

placing a wafer storing structure, containing the semiconductor wafer, at a position in front of a front wall of a lock chamber, on a wafer storing structure table, the wafer storing structure table having an upper region thereover which is open to a wafer storing structure [transfer] transferring path;

carrying in the semiconductor wafer into a vacuum processing chamber, of the plural vacuum processing chambers, using a lock chamber, in which one semiconductor wafer is to be disposed;

processing said semiconductor wafer in said vacuum processing chamber; and

carrying out said semiconductor wafer, processed in said vacuum processing chamber, to said wafer storing structure which had contained the semiconductor wafer prior to carrying the semiconductor wafer into the vacuum processing chamber, using said lock chamber, in which one semiconductor wafer is to be disposed.

19. (Four Times Amended) A method of treating a semiconductor wafer in plural vacuum processing chambers, comprising the steps of:

placing a wafer storing structure, containing the semiconductor wafer, at a position in front of a front wall of a lock chamber, in which one semiconductor wafer is to be disposed, on a wafer storing structure table, the wafer storing structure table having an upper region thereover which is open to a wafer storing structure [transfer] transferring path;

carrying in the semiconductor wafer into a vacuum processing chamber, of the plural vacuum processing chambers, using the lock chamber;

processing said semiconductor wafer in said vacuum processing chamber; and

carrying out said semiconductor wafer, processed in said vacuum processing chamber, to said wafer storing structure which had contained the semiconductor wafer prior to carrying the semiconductor wafer into the vacuum processing

chamber, using said lock chamber, in which one semiconductor wafer is to be disposed.

21. (Four Times Amended) A method of treating a sample in plural vacuum processing chambers, comprising the steps of:

placing a cassette, containing the sample, at a position in front of a front wall of a lock chamber, in which one sample is to be disposed, on a cassette table, the cassette being set at a position where an upper region thereof is open to a wafer storing structure [transfer] transferring path;

carrying in the sample into a vacuum processing chamber, of the plural vacuum processing chambers, using the lock chamber, in which one sample is to be disposed, wherein the sample is carried directly from the cassette to the lock chamber;

processing said sample in said vacuum processing chamber; and

carrying out said sample, processed in said vacuum processing chamber, to said cassette which had contained the sample prior to carrying the sample into the vacuum processing chamber, using said lock chamber, in which one sample is to be disposed.

23. (Four Times Amended) A method of treating a sample in plural vacuum processing chambers, comprising the steps of:

placing a cassette, containing the sample, at a position in front of a front wall of a lock chamber, in which

one sample is to be disposed, on a cassette table, the cassette being set at a position where an upper region thereof is open to a cassette [transfer] transferring path;

carrying in the sample into a vacuum processing chamber, of the plural vacuum processing chambers, using the lock chamber, in which one sample is to be disposed, wherein the sample is carried directly from the cassette to the lock chamber, samples being transferred from the cassette to the lock chamber;

processing said sample in said vacuum processing chamber; and

carrying out said sample, processed in said vacuum processing chamber, to said cassette from which the sample had been carried into the vacuum processing chamber, using said lock chamber, in which one sample is to be disposed.

25. (Four Times Amended) A method of treating a sample in plural vacuum processing chambers, comprising the steps of:

placing a cassette, containing the sample, at a position in a row in front of a front wall of a lock chamber, on a cassette table, disposed at a position where an upper region thereof is open to a cassette [transfer] transferring path, said lock chamber having opening and closing devices for carrying-in samples, to be processed, into the lock chamber and for carrying-out processed samples from the lock chamber;

carrying in the sample into a vacuum processing chamber, of the plural vacuum processing chambers, using the lock chamber, whereby the sample is carried into the lock

chamber from the cassette;

processing said sample in said vacuum processing chamber; and

carrying out said sample, processed in said vacuum processing chamber, using said lock chamber, whereby the sample is carried out from the lock chamber to the cassette,

wherein the sample is carried from the cassette to the lock chamber in a direction opposite to the direction in which the sample is carried out from the lock chamber to the cassette, and

wherein the opening and closing devices of the lock chamber are opened and closed every carrying-in of the sample, to be processed, to the lock chamber, and every carrying-out of the processed sample from the lock chamber.

26. (Four Times Amended) A method of treating a sample in plural vacuum processing chambers, comprising the steps of:

placing a cassette, containing the sample, at a position in a row in front of load and unload lock chambers, the load and unload lock chambers being separate chambers, the cassette being placed on a cassette table, disposed at a position where an upper region thereof is open to a cassette [transfer] transferring path, each of the load and unload lock chambers having opening and closing devices for carrying-in a sample to be processed in a vacuum processing chamber to the load lock chamber and for carrying-out a processed sample from the unload lock chamber;

carrying in the sample into a vacuum processing

chamber, of the plural vacuum processing chambers, using the load lock chamber;

processing said sample in said vacuum processing chamber; and

carrying out said sample, processed in said vacuum processing chamber, using said unload lock chamber,

wherein the opening and closing devices of the load lock chamber are opened and closed every carrying-in of a sample, to be processed, to the load lock chamber, and every carrying-out of a processed sample from the unload lock chamber.

27. (Twice Amended) A transfer method in operating a vacuum processing apparatus, the vacuum processing apparatus including:

a transfer chamber connected to plural vacuum processing chambers in which substrates to be processed are vacuum processed one-by-one;

a cassette table for mounting a cassette which receives plural substrates to be processed or substrates having been processed, said cassette being mounted at a position where an upper region thereof is open to a cassette [transfer] transferring path;

a load lock chamber and an unload lock chamber, for carrying in and carrying out said substrates to be processed or said substrates having been processed, from and to said cassette mounted at said position, and for carrying in and carrying out said substrates to be processed or said

substrates having been processed, from and to any of said vacuum processing chambers through said transfer chamber;

one atmospheric transfer apparatus for transferring said substrates to be processed or said substrates having been processed between said cassette mounted at said position and said load lock chamber and said unload lock chamber; and

gate valves provided respectively at an atmospheric side and a vacuum side of said load lock chamber and said unload lock chamber and for opening and closing at every carry-in and carry-out time, one by one, of said substrates to be processed or said substrates having been processed so as to change over said load lock chamber and said unload lock chamber in an atmospheric atmosphere or a vacuum atmosphere;

wherein the transfer method comprises:

carrying in and carrying out said substrates to be processed or said substrates having been processed, one-by-one, between said load lock chamber or said unload lock chamber at said atmospheric atmosphere and said cassette mounted at said position.

30. (Amended) A transfer method in operating a vacuum processing apparatus, the vacuum processing apparatus including:

a transfer chamber connected to plural vacuum processing chambers in which substrates to be processed are vacuum processed one-by-one;

a cassette table for mounting a cassette which receives plural substrates to be processed or substrates

having been processed, the cassette being mounted at a position where an upper region thereof is open to a cassette [transfer] transferring path;

a load lock chamber for carrying in said substrates to be processed from said cassette mounted at said position and for carrying out said substrates to be processed to any of said vacuum processing chambers through said transfer chamber;

an unload lock chamber for carrying in said substrates having been processed from any of said vacuum processing chambers through said transfer chamber and for carrying out said substrates having been processed to said cassette mounted at said position;

one atmospheric transfer apparatus for transferring said substrates to be processed or said substrates having been processed between said cassette mounted at said position and said load lock chamber and said unload lock chamber; and

gate valves provided respectively at an atmospheric side and a vacuum side of said load lock chamber and said unload lock chamber and for opening and closing at every carry-in and carry-out time, one-by-one of said substrates to be processed or said substrates having been processed so as to change over said load lock chamber or said unload lock chamber in an atmospheric atmosphere or a vacuum atmosphere,

wherein the transfer method comprises:

carrying in and carrying out said substrates to be processed or said substrates having been processed, one-by-one, between said load lock chamber or said unload lock chamber in the atmospheric atmosphere and said cassette

mounted at said position.